

NEW DESCRIPTIONS

SPINY EELS OF THE GENUS *MACROGNATHUS* LACEPEDE FROM MANIPUR, WITH DESCRIPTION OF A NEW SPECIES¹

L. ARUNKUMAR AND H. TOMBI SINGH²

(With four text-figures)

Key words: *Macrognathus morehensis* sp. nov., Yu drainage system, Manipur.

The paper gives a systematic account of two species of *Macrognathus*, hitherto known from Manipur, viz. *M. aral* (Bloch & Schneider) and *M. pancalus* Hamilton-Buchanan, which are distributed in the Barak drainage system and in the hill streams of Manipur respectively. A new species *M. morehensis* occurring in Manipur has been described here. It is found in the southeastern corner of this state and the adjoining areas of Myanmar, drained by the Yu drainage system, known as the Chindwin of Meamer. The diagnostic feature of *M. morehensis* is the combination of the following distinctive characters: 11 to 16 dorsal spines, 20 to 25 broad black transverse bars, 12 to 14 black spots that form imperfect ocelli at the base of dorsal fin rays, 6 black oval spots at the base of dorsal spines, 10 to 13 black spots at the base of anal fin rays, 5 to 7 oblique striations of black dots arranged in longitudinal parallel rows at the dorsal and anal fin rays, 7 to 10 black lines of striations formed by the dots at the caudal fin, a single ocellus at base of caudal fin, 8 to 11 rostral tooth-plates, and 76 vertebrae.

INTRODUCTION

Manipur is an isolated hill state in the northeast corner of India having three drainage systems: the Barak, Manipur, and Yu drainage systems draining the western, central and eastern water bodies respectively (Fig. 4). The Barak drainage system is connected with the Barak-Brahmaputra river system of India, whereas the Manipur drainage and the Yu drainage systems are connected with the Chindwin river system of Myanmar.

Hora (1921) described a new species of spiny eel, *Mastacembelus manipurensis* from Khurda (Khordak) stream of Manipur and *Rhynchobdella dhanashorii* from Dhanashori stream, about a mile from Dimapur, Assam. Menon (1954), while reporting on the fishes known from Manipur, listed two spiny eels, viz. *M. armatus* and *M. manipurensis*. Later, Menon (1974) considered *M. manipurensis* and

R. dhanashorii as synonyms of *M. armatus* and *Macrognathus aculeatus* respectively. Presently, three species, viz. *M. aral* (Bloch & Schneider), *M. guentheri* (Day) and *M. pancalus* Hamilton-Buchanan have been reported from Indian waters (Talwar and Jhingran, 1991).

No further report is available on the spiny eels of the genus *Macrognathus* of Manipur. Recently, several specimens of *Macrognathus* were obtained from the Lokchao river and the Maklang river of the Yu drainage system of this state near Moreh, which is known as Chindwin of Meamer. From this collection, a new species, *Macrognathus morehensis*, is described here.

MATERIAL AND METHODS

Fishes were collected using different types of nets, grouping, dewatering of shallow water pockets and with the help of local fishermen. Some fishes were also purchased from Moreh Bazar, Chandel dist., Manipur, near the Indo-Myanmar border. In the field, their local names and fresh colours were noted. The fishes were

¹Accepted August, 1997.

²Department of Life Sciences, Manipur University, Canchipur 795 003, Imphal, Manipur, India.

then preserved in 10% formaline and brought to the Fishery Laboratory of Manipur University.

The fishes were identified with reference to Day (1889), Hamilton-Buchanan (1822), Roberts (1980, 1986) and, Talwar and Jhingran (1991). The specimens were deposited in the Manipur University Museum of Fishes (MUMF). Registration numbers are given below.

RESULTS

Macrognathus aral (Bloch & Schneider)
(Fig. 1)

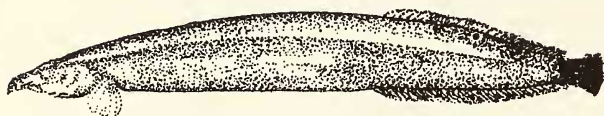


Fig. 1: *Macrognathus aral* (Bloch and Schneider)

Rhynchobdella dhanashorji Hora, 1921. *Rec. Indian Mus.*, XXII: 205, Pl. IX fig. 2 (sp. nov.).

Macrognathus aral Roberts, 1980. *Copeia*, 3: 385-391, fig. 1 2b (Revision).

Macrognathus aral Talwar & Jhingran, 1991 *Inland Fish. India & Adjacent Countries*, 2: 1026 (Distribution extended).

Manipuri name: *Ngaril/Jirigi ngaril pokchaobi/Ngaril yangmitpanbi*.

Material examined: 3 exs. Uncat. MUMF. 1 from Jiri River; 120 mm total length; 7.viii.1995, 2 ex. Makru stream; 124 to 135 mm total length; 2.ix.1985, coll. M.G. Sharma, 1 ex. MUMF 201/1A, Jiri River, 205 mm total length, 16.x.1992, coll. L.A.

Distribution: Manipur: Barak drainage system.

Remarks: Formerly reported as *M. aculeatus* and distributed strictly in the western sides of this state, drained by the Barak drainage system of the Brahmaputra system in India. It is easily distinguished from *M. aculeatus* by the lack of 14 to 17 oblique dark bars on the body

and smaller number of rostral tooth-plates (18 to 21 vs. 38 to 55). Roberts (1980) stated that *M. aculeatus* was known from the southern half of the Malay Peninsula: several of the principal rivers of Sumatra; the Kapuas river of Borneo and northern Java as far east as the Brantas river. The specimens (*M. aral*) from the Barak drainage of Manipur are similar to *M. siamensis* (Roberts 1980) in the presence of ocelli at the base of dorsal fin rays, but can be easily distinguished by the lack of ocelli at caudal fin, smaller number of rostral tooth-plates (18 to 21 vs. 7 to 14), and total number of vertebrae (71 vs. 75).

Macrognathus pancalus Hamilton-Buchanan
(Fig. 2)

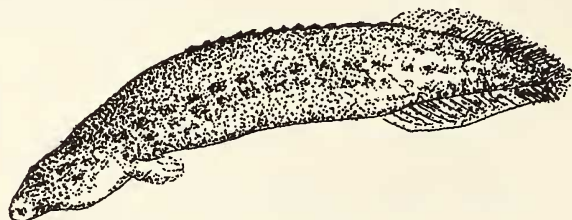


Fig. 2: *Macrognathus pancalus* Hamilton-Buchanan

Macrognathus pancalus Hamilton-Buchanan, 1822. *Fish Ganges*, 30, 364. pl. XXII, fig. 7.

Mastacembelus pancalus Sufi, 1956 *Bull. Raffles Mus.*, 27: 93-146 (Revision).

Macrognathus pancalus Talwar & Jhingran, 1991 *Inland Fish. India & Adjacent Countries*, 2: 1027-1028, Fig. 292.

Manipuri name: *Ngaril/Ching-ngaril-macha*.

Material examined: 3 exs. MUMF 202/3A, 1 ex. Jiri River; 111 mm total length; 13.xii.1990, 1 ex. Litan stream at the root of Thoubal river; 132 mm total length; 15.xi.1991 and 1 ex. Maklang river; 124 mm total length; 8.xii.1992, coll. L.A.

Distribution: Manipur: Hill streams and

rivers of the Barak drainage, the upper and lower regions of Manipur drainage and the Yu drainage system.

Remarks: It is the smallest among spiny eels and mainly found in hill streams. A distinct streak of longitudinal spots runs along the lateral line from the eye to the base of caudal fin in the present specimen, with 65 to 66 vertebrae. Roberts (1986) mentioned that it belongs to the second group of *Macrogathus* which lack rostral tooth-plates.

Macrogathus morehensis sp. nov.

(Fig. 3)

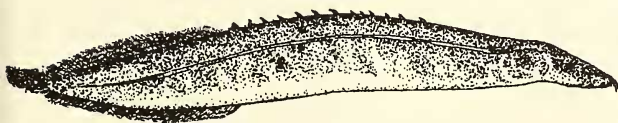


Fig. 3: *Macrogathus morehensis* sp. nov., MUMF 203/8A Paratype, 147 mm TL, Manipur: Yu drainage system.

Holotype: MUMF 203/1A, from Maklang river near Moreh Bazar, Chandel district, 155 mm total length 17.x.1992. Coll. L.A.

Paratypes: MUMF 203/8A, 3, from Lokchao river near Moreh Bazar. 5 from Moreh Bazar; near Indo-Myanmar border, 80 to 147 mm total length. 21.x.1992. Coll. L.A.

Manipuri name: *Ngari/Ngamoi-tup/Ngamu-tup/Tou-ngaril*

Diagnosis: A *Macrogathus* has the distinctive combination of the following characters: (i) 11 to 16 dorsal fin spines, (ii) 20 to 25 black broad transverse bars on the body, (iii) 8 to 11 rostral tooth-plates, (iv) 12 to 14 black spots that are imperfect ocelli at the base of dorsal fin rays, (v) 10 to 13 distinct black spots at the base of anal fin rays, (vi) 6 black oval spots at the base of dorsal spines, (vii) 5 to 7 oblique striations of black dots arranged in parallel longitudinal rows at the dorsal and anal fin rays, (viii) 7 to 10 black lines of striations

formed by dots at the caudal fin, (ix) a single ocellus at the base of caudal fin and (x) 76 vertebrae.

Description: Br. 3-5, D. 11-16/39-51, P. 15-20, A. 3/40-54, C. 11-14. Body slightly compressed. Rostrum slightly rounded. Pre-orbital and pre-opercular spines absent. Head long and pointed. Mouth inferior, cleft of mouth narrow. Ventral side of snout transversely striated by 2 to 4 black bars. Eyes not visible from ventral side and covered by a thin membrane. Eye diameter more or less same as the interorbital distance. Lips thin. No gill rakers. Caudal fin distinctly separated from the dorsal and anal fins. Scales are minute. The third anal spine is very near the origin of anal soft fin rays and difficult to identify, since it is buried inside the skin.

Proportional measurements of holotype and paratypes (the latter in parenthesis): Depth of body 10.97 (11.11-12.93), height of head at eye 4.51 (4.08-6.25), height of head at occiput 6.45 (6.25-7.69), length of head at the end of lateral operculum 17.42 (17.36-22.22) and length of caudal fin 7.09 (6.94-9.52) in the percentage of total length respectively.

Depth of body 11.80 (11.94-13.79), height of head at eye 4.86 (4.41-6.84), height of head at occiput 6.94 (6.72-8.33), length of head at the end of lateral operculum 18.76 (18.65-24.33), length of pectoral fin 6.94 (7.14-8.62), predorsal length at the origin of dorsal fin spine of 43.85 (43.29-46.72), and predorsal length at the origin of dorsal fin soft rays 63.29 (62.11-69.93) in the percentage of standard length respectively.

Diameter of eye 33.33 (33.33-35.59), interorbital distance 33.33 (33.33-35.95) and width of mouth 22.22 (20.00-25.00) in percentage of length of snout respectively.

Colour: Body light yellowish to ashy. In young stages (81-120 mm total length), the dorsal fin soft rays, anal fin soft rays and caudal

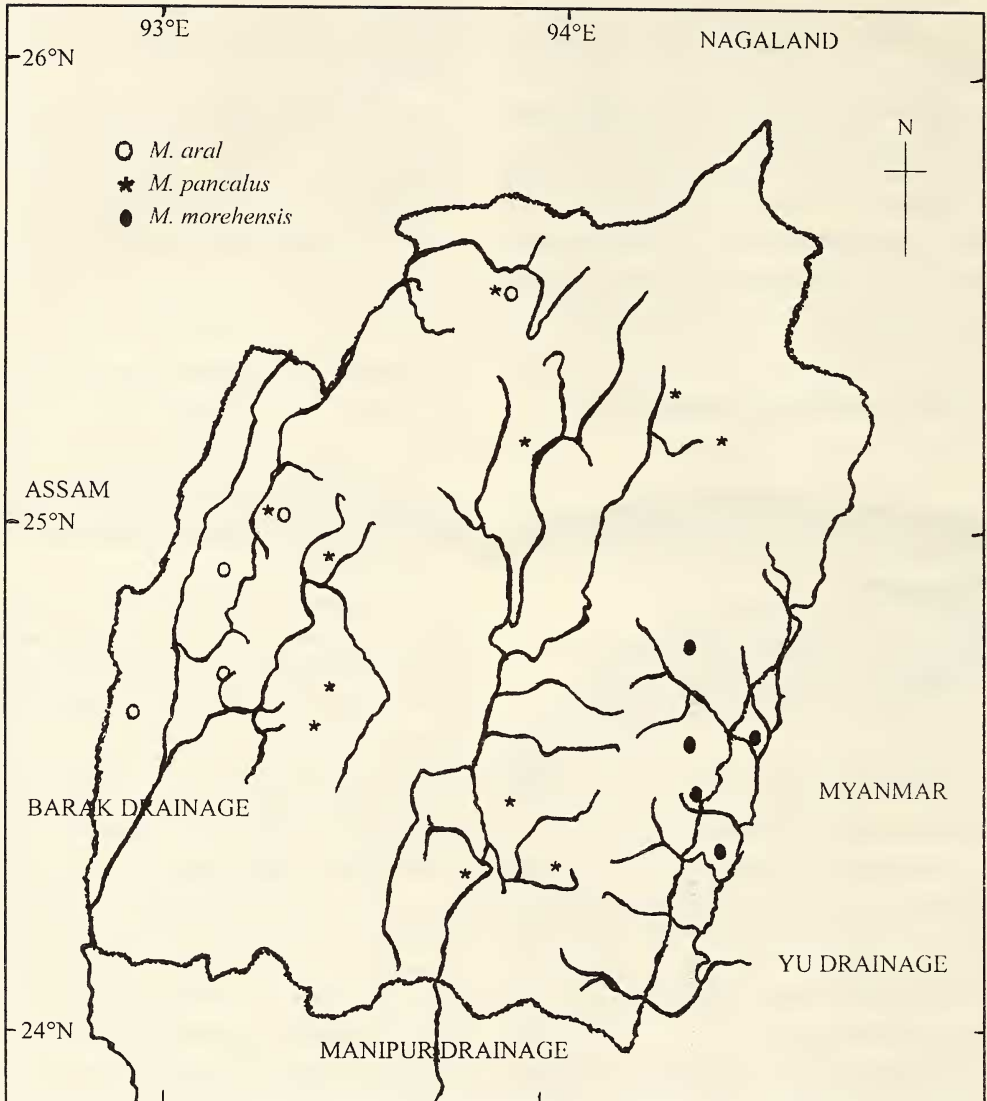


Fig. 4: Map of Manipur showing distribution of *Macrognathus*

fins are distinctly red with black striations and pin dotted transverse bars along their entire length. Abdomen yellowish white.

Habitats: *M. morehensis* has a habit of actively burrowing in the swampy and vegetated stream bed. The inhabitants of Kwatha village near Moreh, of the Indo-Myanmar border call it 'Tou-ngaril', according to the habitat of the fish.

The fish hides under pebbles, stones, gravel, sandy beds of clear torrential stream. It makes small pits and holes in the swampy and vegetated beds of stagnant streams and waterbodies. The fish is associated with *Amblypharyngodon mola*, *Aspidoparia morar*, *Badis badis*, *Chanda nama*, *Chela laubuca*, *Colisa fasciata*, *Danio aequipinnatus*, *Esomus danericus*, *Garra graveyi*,

G. lissorhynchus, *G. rupecola*, *Glyptothorax pectinopterus*, *G. platypogonoides*, *G. trilineatus*, *Mystus bleekeri*, *M. cavasius*, *Nemacheilus vinciguerrae* and *Parluciosoma daniconius*. Its distribution extends upto Tumu of Myanmar.

Remarks: *M. morehensis* is easily distinguished from *M. guentheri* (Day) and *M. pancalus* Hamilton-Buchanan by the presence of rostral tooth-plates. It is also easily distinguished from *M. aral* (Bloch & Schneider) by the presence of less rostral tooth-plates (8-11 vs. 14-28), dorsal fin spines (11-16 vs. 16-23), total number of vertebrae (76 vs. 71), coloration (indistinct i.e. imperfect ocelli vs. distinct ocelli at base of the dorsal soft fin rays, and an ocellus at base of caudal fin vs. absent) and specific distribution, viz. Yu drainage system vs. Barak drainage system of Manipur.

Etymology: The specific name is derived from Moreh, the type locality of the fish.

Discussion: Roberts (1980, 1986) stated that *M. aculeatus* was known strictly from the southern half of the Malay Peninsula. He synonymised and referred all the formerly well known species of *M. aculeatus* which are distributed in India to *M. aral*. *M. aculeatus* had not been found in Myanmar or in the Indian subcontinent, but was found in Thailand at Surat Thani, Chiao Lam and the Tapi River basin.

M. morehensis can be easily differentiated from *M. caudicellatus*, *M. circumcinctus*, *M. semiocellatus* and *M. zebrinus* by the absence of preopercular and preorbital spines, and presence of rostral tooth-plates.

M. morehensis differs from *M. aral* in having a smaller number of rostral tooth-plates (8-11 vs. 14-28), fewer dorsal fin spines (11-16 vs. 16-23), more vertebrae (76 vs 71) and pattern of bands (20 to 25 transverse dark bars vs. 2 pale longitudinal stripes along its entire length).

M. morehensis differs from *M. aculeatus* in having fewer rostral tooth-plates (8-11 vs. 29-55) and numbers of oblique transverse bars on the body (20-25 vs. 14-17).

M. morehensis differs from *M. meklongensis* in having a smaller number of dorsal fin rays (39-51 vs. 50-54), pectoral fin rays (15-20 vs. 22-23), caudal fin rays (11-14 vs. 16-19), coloration of black spots at dorsal fin base (12-14 distinct large spots which are imperfect ocelli vs. no ocelli or 10-12 faint small ocelli), rim of anterior nostril with finger-like projections (absent vs. 6) and transverse bars on the body (20-25 vs. absence of transverse bars).

M. morehensis differs from *M. siamensis* in the presence of fine dark striations in the caudal fin (7-10 fine black striations formed by dots vs. absence of striations), ocelli in the dorsal fin base (12-14 black spots which are imperfect ocelli vs. with series of large and distinct form of ocelli), fine oblique striations in the dorsal soft fin-rays (5-7 vs. absent) and distribution (Manipur vs. Thailand and Kampuchea).

M. morehensis has a restricted distribution in Moreh, near the Indo-Myanmar border, Chandel Dist., Manipur at lower portion of Lokchao river, Pumpum stream of Kwatha, Lairok Maru, lower portion of Maklang river, which belong to the Yu drainage system of Manipur, extend to Myanmar and join the Chindwin river. The fish was also collected from the adjoining areas of Manipur-Myanmar border of the Yu river system, which is known as the Chindwin of Meaner.

According to Kottelat (1989) and Zakaria-Ismail (1994), *M. aral*, *M. caudicellatus* and *M. zebrinus* are the Salween elements of fishes. Kottelat (loc. cit.) described *M. aculeatus* as the Malay peninsular element of fish and *M. circumcinctus*, *M. meklongensis*, *M. semiocellatus* and *M. siamensis* as the Thailand elements of fishes. According to Zakaria-Ismail (loc. cit.) *M. aculeatus*, *M. caudicellatus*, *M. circumcinctus*, *M. meklongensis*, *M. semiocellatus* and *M. siamensis* belong to the Indo-Chinese elements of fishes. *M. pancalus* is the true Indian element of fish. Hence *M. morehensis* is a distinct species with

NEW DESCRIPTIONS

meristic, morphometry, anatomy (vertebrae), colour pattern and specific distributional areas, i.e. the Chindwin of Meamer as the defining features.

ACKNOWLEDGEMENTS

The first author thanks Dr. W. Vishwanath

of Manipur University, Dr. Maurice Kottelat of Switzerland (CMK), Dr. Kelvin K.P. Lim, and Dr. Peter K.L. Ng of National University, Singapore and Dr. Mohd. Zakaria Ismail of University of Malaya for help. We also thank UGC, Special Assistance Programme, Life Sciences Department, Manipur University for financial assistance.

REFERENCES

- DAY, F. (1889): The Fauna of British India, including Ceylon and Burma, Fishes, 2, 509. Taylor and Francis, London.
- HAMILTON-BUCHANAN, F. (1822): An account of the fishes found in the river Ganges and its tributaries. vii, 1-405, 39 pls. Edinburgh and London.
- HORA, S.L. (1921): Fish and fisheries of Manipur with some observations on those of Naga Hills. *Rec. Indian Mus.* 22(3): 165-214.
- KOTTELAT, M. (1989): Zoogeography of the fishes from Indo-Chinese inland waters with an annotated checklist. *Bull. Zool. Mus.* 12: 1-55.
- MENON, A.G.K. (1954): Further observations on the fish fauna of Manipur state. *Rec. Indian Mus.* 25(1): 21-26.
- MENON, A.G.K. (1974): A check-list of fishes of the Himalayan and the Indo-Gangetic plains. Inland Fisheries Society of India. Special Publications. 1. pp 136.
- ROBERTS, T.R. (1980): A revision of the Asian Mastacembelid fish genus *Macrogathus*. *Copeia* 3: 385-391.
- ROBERTS, T.R. (1986): Systematic review of the Mastacembelidae or Spiny eels of Burma and Thailand, with description of two new species of *Macrogathus*. *Jap. J. Ichthyol.* 33(2): 95-109.
- SUFI, S.F.K. (1956): Revision of the Oriental fishes of the family Mastacembelidae. *Bull. Raffles Mus.* 27: 93-146.
- TALWAR, P.K. & A.G. JHINGRAN: Inland Fishes of India and Adjacent Countries. 2, Oxford & IBH Publishing Co. Pvt. Ltd., Calcutta. 543-1158.
- ZAKARIA-ISMAIL, M. (1994): Zoogeography and biodiversity of the freshwater fishes of Southeast Asia. *Hydrobiologia.* 285: 41-48.

